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Public Health
Seattle & King County

QUESTIONS & ANSWERS ABOUT WEST NILE VIRUS

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What is West Nile virus?

West Nile virus is a mosquito-borne virus first identified in the West Nile region of Africa in 1937. Since then the virus has caused outbreaks of disease in Africa, Asia, Eastern Europe and the Middle East, but it did not appear in the United States until 1999. After first being discovered in birds and people in the metropolitan New York City area, it spread westward across the US and into Canada and Mexico. In October, 2006, West Nile virus was detected in King County for the first time when 6 birds and a horse tested positive for the virus. In 2006, Washington State had its first human cases when West Nile virus fever was diagnosed in residents of Pierce County (2 cases) and Clark County (1 case). In 2007, there were eight horses, one bird and one dog reported positive in Yakima County. There were no West Nile virus cases reported in King County.

West Nile virus can infect humans, birds, mosquitoes, horses and other animals, although disease is rare in dogs and cats. Wild birds become infected with West Nile virus and carry the virus in nature. Mosquitoes become infected after feeding on infected birds. People bitten by a mosquito carrying West Nile virus may have no symptoms at all or they may become ill with symptoms ranging from mild to severe. The less serious form is called West Nile fever, a flu-like illness that may last from a few days to several weeks. In the more severe forms, West Nile virus affects the nervous system causing swelling and inflammation of the brain or covering of the spinal cord (called neuroinvasive disease) and may result in paralysis and death.

What are the human health effects of West Nile virus infection?

Fortunately, most people who become infected with West Nile virus do not get sick--their body fights off the infection and protective antibodies develop. About 20% (1 person out of 5) develop West Nile fever with symptoms that may include fever, muscle aches, fatigue, headache, rash, and joint pain. Some people with West Nile fever are quite ill for up to several weeks and may see their doctor, but hospital care is not usually needed.

Less than 1 percent (about 1 in every 150) of persons who become infected with West Nile virus develop the more serious neuroinvasive form of the disease. Types of neuroinvasive disease include: West Nile encephalitis, West Nile meningitis, and West Nile meningoencephalitis. Encephalitis refers to inflammation of the brain. Meningitis is inflammation of the membrane covering the brain and spinal cord. Meningoencephalitis is a combination of the two syndromes. Symptoms may include fever, neck stiffness, confusion, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis.

Persons who survive West Nile neuroinvasive disease may have long-term symptoms or disabilities, but recovery from the milder forms of infection is usually complete. It is believed that once someone has had an infection caused by West Nile virus they develop long-term protection against being infected again.

How many human cases of West Nile virus occurred last year?

In 2007, there were 3, 623 cases of West Nile virus illness reported in the US, a decrease compared to 2006 when 4,180 cases were recorded. Of the 3,623 human cases in 2007, 65% had West Nile fever and 33% had neuroinvasive disease (in 2% the illness type was not reported). States with the highest number of cases in 2007 were Colorado, California, and North Dakota. Colorado was particularly hard hit with about 576 residents reported with West Nile virus illness. For up-to-date information about West Nile virus cases and deaths by state, see the Centers for Disease Control and Prevention (CDC) website at: http://www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm.

How many people have died of West Nile virus infection?

In 2007 in the US there were 124 deaths reported due to West Nile virus disease compared to the 149 deaths recorded in 2006, but similar to the 119 deaths in 2005. Most deaths due to West Nile virus are among older people, with the median age of persons who died being about 75 years (median age means that half the persons who died were older than 75 and half were younger). However, death has occurred in all age groups from infants to young adults to the very elderly.

Are there persons who are at greater risk of developing more severe illness?

Yes. The risk for more serious illness starts to increase after about age 50. Based on reports to the CDC, the median age of persons who developed the more serious neuroinvasive form of the disease was 57 years and the median age of those who died was 75 years (median age means that half the individuals were older and half were younger). In addition to age, diabetes may also increase the risk for severe illness. Children are not at greater risk than young- or middle-age adults. Pregnancy is not known to increase the risk of developing the severe forms of West Nile virus infection; however there have been a small number of cases where a pregnant mother contracted West Nile virus and passed it to her unborn baby.

How is West Nile virus transmitted?

West Nile virus is transmitted by the bite of a mosquito. Mosquitoes become infected when they feed on birds carrying the virus. When the mosquito takes a blood meal from the infected bird, the virus becomes located in the salivary gland of the mosquito. Then when the mosquito bites a human or animal, the mosquito injects the virus into its victim. Persons who become ill develop symptoms 3 to 14 days after infection. The West Nile virus remains in infected individuals for a relatively short time and does not cause chronic infections.

West Nile virus is not transmitted directly from person-to-person except for rare cases attributed to blood transfusion or organ transplantation (see the next question). It is also not transmitted from animal-to-person except in very rare instances related to occupational exposure. There is no evidence that persons can become infected from eating meat from a West Nile virus infected bird or other animal.

Can I get a West Nile virus infection from a blood or organ donation?

Although rare, West Nile virus has been transmitted through transfusions of whole blood or blood components such as plasma or platelets. Blood component suppliers are taking preventative measures to screen out blood donors who may have been infected with West Nile virus. A laboratory test for West Nile virus has been in use for screening blood donors since July 2003. There have been documented instances of West Nile virus transmission by organ transplantation, but the risk of this is extremely low.

Are pets and domestic animals at risk of West Nile virus?

Fortunately, clinical illness due to West Nile virus is rare in dogs and cats, and chickens are resistant as well. Persons with pet birds should be careful to protect them from mosquito bites. Horses and other equines like mules and donkeys are susceptible to West Nile virus infection and severe illness and death can result. An equine West Nile virus vaccine is available and horse owners are strongly encouraged to consult with their veterinarian about immunization. Horses will also benefit from mosquito control efforts.

In King County, what is Public Health doing about West Nile virus?

Public Health surveillance activities are underway to monitor West Nile virus in birds, mosquitoes, animals, and humans. West Nile virus is usually detected in birds or horses before cases occur in humans. In addition, Public Health provides information on personal protective measures and environmental measures that can be taken to reduce the risk of mosquito-borne diseases. Care is taken to provide West Nile prevention education to non-English speaking groups within the county. Public Health also works with municipal governments and other agencies throughout King County to promote mosquito surveillance, reduction of mosquito habitat and other control measures.

Health care providers and hospitals are required by law to report to Public Health suspected cases of viral encephalitis including cases suspected to be caused by West Nile virus. For more information, consult the Public Health website at: http://www.metrokc.gov/health/providers/wnv-clinicians.htm

What is the connection between crows and West Nile virus?

Crows and other corvid birds (like jays, ravens and magpies) are particularly susceptible to West Nile virus, and often sicken and die from it. Therefore, in partnership with the Washington State Department of Health, Public Health is testing some dead crows and other corvids to see if they have died from West Nile virus.

What do I do if I find a dead crow?

If you find a dead crow, jay, raven or magpie in King County, call Public Health at 206-205-4394 or report on-line at www.metrokc.gov/health/westnile/deadbird.htm. Information about the bird will be entered into a tracking database and mapped. In addition, the bird you find may be selected for testing for West Nile virus. When you call, you will be asked a few questions. First, is the bird freshly dead (dead less than 24 hours)? Second, where and when did you find the dead bird? We will need to know the address where the bird was found. Third, is the bird undamaged? Only undamaged birds can be tested.

Not all crows and other corvids need to be tested for Public Health to effectively monitor for West Nile virus. In fact, we receive many more calls reporting dead crows than the laboratory could test. Also, we collect birds for West Nile virus testing primarily from mid-summer through late October because this is the time of year that crows are most likely to carry the virus.

If the bird you find is not appropriate for testing, you may dispose of it in your garbage can. Public Health is tracking all bird deaths, so even if the bird you find will not be tested, we are still interested in the information you provide. Birds discovered on Friday afternoon or Saturday will not be tested and should be disposed of in the garbage.

If the bird you find is not needed for testing, use gloves or a shovel to pickup the bird, then double bag it in plastic bags and dispose of it in your garbage. Though dead birds will not transmit West Nile virus, you should not handle dead animals with your bare hands.

What if the dead bird I find is not a crow?

To help us learn more about West Nile virus Public Health is tracking the deaths of a variety of birds. The types of birds other than crows that may be affected by West Nile virus are ravens, jays, magpies, raptors (eagles, hawks, and owls), and smaller birds including robins, sparrows, and finches. In addition, we are interested in reports on waterfowl (ducks, geese, swans), shorebirds, and domestic poultry (chickens, turkeys) as mortality in these birds is monitored for possible avian influenza. Call Public Health at 206-205-4394 or report on-line at www.metrokc.gov/health/westnile/deadbird.htm if you find any type of dead bird.

What is the life cycle of the mosquito and what do their larvae look like?

Mosquitoes like still or standing water to lay their eggs. Stagnant water containing organic materials like dirt or plant matter is especially attractive to many types of mosquitoes. Once laid, mosquito eggs hatch into larvae and develop into adults in as few as seven days in very hot weather. Some species need only a few ounces of water to lay eggs.

Larvae ("wigglers") are ¼ to ½ inch long, or smaller. They move by vigorously wiggling or flexing their bodies. They are usually dark in color and look like tiny aquatic worms. Though there are variations dependent on weather and temperature, mosquito larvae are most likely to be present in King County from March through October.

What can I do to reduce the number of mosquitoes?

Removing sources of standing water on your property and around your home reduces mosquito breeding

habitat. Examples of things you can do include:

- Tip water out of barrels, buckets and wheelbarrows and turn them over so water cannot collect
- Tip out containers that could hold water such as toys, cans or plant saucers weekly
- Empty children's wading pools weekly
- Change water in birdbaths, pet watering dishes and animal troughs at least once a week
- Discard, properly store or drill holes in used tires
- Clean debris from ornamental ponds and keep fountains running during the summer
- Stock ornamental ponds with fish
- Maintain swimming pools and hot tubs
- Recycle old bottles, buckets, and cans
- Clean leaf-clogged gutters
- Drain flat topped roofs
- Dump water off of tarps and plastic sheeting
- Drain water from covers on pools, boats and hot tubs
- Repair leaky outdoor faucets
- Cover rain barrels with mosquito screens
- Cover garbage cans with an appropriate lid
- Repair ripped window and door screens and make sure they fit tight; use a screen door on doors that often are left open
- Consult a licensed pest control operator for mosquito habitat that cannot be controlled by drainage or other means.

Help your elderly or frail neighbors and relatives with these activities (older people are more vulnerable to severe West Nile virus).

What can be done to avoid mosquito bites?

Be aware of the times of day when mosquitoes are most likely to be biting. The prime biting periods are often at dusk and dawn. If you do go outside when mosquitoes are biting, wear long sleeve shirts, long pants, and socks. Hats are also useful. If you are frequently outside when mosquitoes are biting, consider wearing special clothing that has been treated with permethrin to repel mosquitoes.

To help keep mosquitoes out of your home, ensure that window and door screens are in good repair and fit tightly. Reducing mosquito breeding habitat around your home will also help decrease the number of biting mosquitoes (see previous section).

Consider wearing an insect repellent. Repellents containing DEET (N,N-diethyl-meta-toluamide) or picaridin are known to be very effective. Oil of lemon eucalyptus can also be effective but may not offer protection for as long as DEET or picaridin. For current information about mosquito repellents from the Centers for Disease Control, see: www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm

For more information about how repellents work and how to use them safely, see: http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm

What precautions should be taken when using a mosquito repellent?

The American Academy of Pediatrics advises that DEET products not be used on infants under 2 months of age. The Academy has no age recommendations on picaridin products. Whenever using any repellent product, it is important to read the label and follow the instructions carefully. For more information about repellent use for children, see: www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm#kids

Follow the general safety precautions listed below when using insect repellents:

- Always follow product label instructions.
- Use only enough repellent to cover exposed areas of skin; reapply if mosquitoes start biting.
- Do not apply repellent to areas that are covered by clothing.
- Never use repellents over cuts or irritated skin, and do not spray into eyes or mouth.
- Do not apply directly to face, but spray on hands first and then apply to face.

- Wash off treated areas of skin with soap and water after returning indoors.
- Wash treated clothing before wearing again (this may vary by product, follow label instructions).
- If you get a rash or another reaction, stop using the repellent and wash off the treated area with mild soap and water, and call the Washington Poison Center at 1-800-222-1222 (http://www.wapc.org/). If you see a health care provider, bring the product with you.
- The Centers for Disease Control and Prevention (CDC) recommends against use of single combination products containing DEET and sunscreen because the instructions for insect repellent and sunscreen use are different (sunscreen usually needs to be applied more often than insect repellent). Instead use separate insect repellent and sunscreen products. Apply sunscreen first, then repellent.

What steps is King County taking to reduce the potential threat of mosquitoes?

Public Health is working with county agencies, cities, the state and sister agencies nationwide to learn about the best methods to use to control mosquitoes. King County's approach uses the principles of integrated pest management and is balanced and is protective of both humans and the environment. Public Health is working to identify the mosquito species that live in our region by collecting data on mosquitoes from a variety of habitats. These data help with effective educational and control programs.

What are some of the substances that King County is using or considering to control mosquitoes?

One approach is the application of natural larvicides in limited and targeted areas to control immature mosquitoes before they emerge as adults. These larvicides are usually in the form of pellets or briquettes. *Bacillus thuringiensis israelensis* or *B. sphaericus* are being used in some areas of the county for control of mosquito larva. They contain naturally-occurring soil bacteria that can be used in organic gardening.

What can I do if I have a mosquito problem in my neighborhood?

Reduce breeding habitat on your own property where possible (see above). If you notice that mosquitoes are a problem, please call Public Health at 206-205-4394. Public Health does not have any regulatory authority to require property owners to remove mosquito habitat except if the habitat is in violation of solid waste law. However, we can send educational materials that provide guidance on reducing habitat. If the habitat is on public property, we will inform and advise the appropriate property owner. Finally, we are tracking specific locations that seem to be particular mosquito problem areas.

Aren't wetlands and retention ponds sources of mosquito habitat?

Wetlands and other natural water features may potentially be mosquito breeding habitat under certain conditions. Fortunately, wetlands also have many natural predators that feed on mosquito larva or adult mosquitoes and this often helps keep mosquito populations down. It is undesirable to drain or fill wetlands because they play an important role in cleaning and holding storm run off - they play a critical public health role. Man-made retention and detention ponds play an important role as well. For information on King County properties such as retention/detention ponds and wetlands, visit: http://dnr.metrokc.gov/dnradmin/press/2002/0916wnv.htm

Resources

For late breaking information, call Public Health's West Nile virus hotline: 206-205-3883.

To report a dead bird or mosquito problem, call Public Health's Environmental Health team at 206-205-4394 during normal business hours - Monday - Friday from 8:00 a.m. to 5:00 p.m. To report a dead bird on-line, go to www.metrokc.gov/health/westnile/deadbird.htm

For more on West Nile virus in Washington State: www.doh.wa.gov/ehp/ts/Zoo/WNV/WNV.html

For more extensive information about West Nile virus, consult the Centers for Disease Control and Prevention website at: www.cdc.gov/ncidod/dvbid/westnile/q&a.htm